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APPRAISING PUPIL COMPETENCE
IN COMPREHENSION OF SCIENCE AND SOCIAL STUDIES MATERIAL

by

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A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Appraising Pupil Competence in Comprehension of Science and Social Studies Material" submitted by Wilma Edna Muir in partial fulfilment for the degree of Master of Education.

ABSTRACT

The major comprehension demands in content reading appear to involve either the lexical or the structural aspects of meaning.

The purpose of this study was to determine whether pupil performance in cloze tests which measure comprehension of lexical and structural meaning in science and social studies material predicts performance in standardized reading comprehension tests in social studies, science and general silent reading.

The test population consisted of 300 pupils randomly selected from two schools representative of the highest and lowest socio-economic districts of the Edmonton Public School Board. One hundred pupils were selected from each of grades 4, 6 and 8.

Variables selected for statistical control in this study included chronological age, intelligence, socio-economic status, grade, sex, and general silent reading ability. The data on the first five variables were obtained from school records. Pupils' silent reading ability was established by administering the Iowa Silent Reading Test, Form Am (Revised).

To assess the pupils' ability to understand structural and lexical meaning, modified cloze tests were administered, using science and social studies sub-tests of Iowa Silent Reading Test, Forms B and C.

Five hypotheses were formulated and tested by statistical procedure involving multiple linear regression analysis, Pearson product-moment correlations and one-way variance.

Analysis of the data indicated that pupils' performance in science and social studies comprehension tests can be predicted by their performance in cloze tests involving either lexical or structural deletion patterns. Cloze test performance also predicted general silent reading ability. At the fourth and sixth grade levels, performance in both lexical and structural cloze tests predicted achievement in social studies and science reading comprehension. However, at the grade 8 level, structural cloze test performance ceased to predict achievement in science and social studies reading comprehension.

Ability to comprehend lexical and structural meaning appeared to be of a developmental nature from grades 4 to 6. However, growth in ability to comprehend structural meaning did not seem evident between grades 6 and 8. The socio-economic status of pupils appeared to be a significant factor in structural cloze test performance at the 4th grade level.

The findings of the study indicated that valuable information concerning pupils' content reading development could be gleaned from structural and lexical cloze test results.

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CHAPTER I

OVERVIEW OF THE STUDY

I. STATEMENT OF THE PROBLEM

Teachers express concern over evidence that some pupils who appear to be competent in their silent reading of material such as that found in many basal readers are experiencing difficulty in comprehending material from the content areas of science, social studies, or mathematics. Furthermore, some pupils seem to experience more reading difficulty in one subject than in another.

Can we identify elements in content reading which might account for these variations in pupil performance? To what extent do the specialized vocabulary and different organizational patterns of the subject material factors contribute to the problem? Can tests identify possible areas of difficulty or those which predict probable success in content reading? An attempt to answer these questions is the purpose of this study.

Before examining the questions more specifically, however, it may be helpful to review briefly the general processes and skills involved in reading comprehension, those skills which are possibly unique to content reading, and the means available for identifying and measuring these skills.

Reading Comprehension

Reading comprehension is a composite of many skills which are inseparably interrelated. These are the skills involved in the recognition of letter and word symbols; the attaching of sound and meaning to words; and the selection of the correct meaning of a word from among many possible meanings and shades of meaning as determined by context. Other essential skills would include those required to organize the ideas developed from word meanings within the sentence, paragraphs, and longer passages; and to utilize these ideas for some immediate or future purposes.

Perception of printed word symbols begins with the reader's awareness of sensory stimulation produced by the graphic symbols. The reader responds visually to these symbols (singly and in groups), and auditorily to the sounds for which the symbols stand. Although this preliminary identification of the printed word symbols is essential to perception, the meaning of the word is not grasped until the reader remembers experience with which he can associate the word. Naturally, the richer and more numerous these associations are, the more meaningful the printed word becomes. However, the additional clues provided by associating the word symbol with spoken words and experience bring to the reader's page only a literal meaning. Complete comprehension demands a further search for meaning in the clues given by the context in which the word is found.

Context, with its varied semantic and syntactic patterns, places certain linguistic restraints upon word meanings. The extent to which these restrictions coincide with the semantic and syntactic habits which the reader has developed through his language experience

determines, in part at least, his ability to take advantage of the clues given by context.

The complex interrelatedness of factors involved in the comprehension process thus becomes evident. Sensory processes are necessary for the recognition of word symbols, yet they themselves are influenced by the perceptual clues supplied by the spoken word equivalents and their associations with experiences. Perception is limited or aided by the ability of the reader to use meaning clues provided by the senses, context, spoken language, and experience. These sources of meaning are, in turn, dependent upon the reader's physical, intellectual, emotional, and cultural background. Moreover, all of these factors are influenced by the reader's purpose for reading the material, his attitude at the time of the reading, and his particular learning style.

Content Reading

Comprehension in the content fields is complicated by the fact that each content subject appears to impose on its readers its own peculiar comprehension demands. In addition to comprehension skills in general, each subject seems to require a particular set of skills, or a unique application of them.

Content subjects appear to have in their material two main areas of differences: (1) vocabulary pertaining to the specialization of the subject; (2) organization of the language patterns of the material. In other words, the main areas of difference seem to be either lexical or structural in nature.

Table I identifies a number of these lexical and structural factors in three content areas - literature, science and social

TABLE I

DIFFERENCES IN CONTEXT OF MATERIAL IN THREE
CONTENT SUBJECTS

Content Area	Structural Context	Lexical Context
Literature	<ul style="list-style-type: none"> - familiar, definite structure - considerable redundancy - running narrative style with diversity of connectives 	<ul style="list-style-type: none"> - words denoting names, objects, feelings, places, events, and actions with which the reader can usually identify - few new concepts presented at a time
Science	<ul style="list-style-type: none"> - unpredictable sentence and paragraph structure often involving question and answer, explanation, following directions, hypothesizing, and classifying, in the same passage - complex connectives denoting the above mentioned processes 	<ul style="list-style-type: none"> - highly specialized terms, mathematical and precise - heavy with factual material - often introduces many new concepts in the same passage - contains polysemantic terms
Social Studies	<ul style="list-style-type: none"> - unpredictable structure often involving: analysis, comparison, contrast, ordering of events, cause-effect, and generalizing - complex connectives denoting the above mentioned processes - all types of composition style 	<ul style="list-style-type: none"> - many words representing abstract concepts - heavy with factual material - many proper nouns denoting unfamiliar names, places, times

Studies.

The lexical restrictions imposed by the specialized vocabularies of content subject areas are obvious. The semantic meaning of a context is indicated to a great extent by the lexical terms which carry their meaning inherently and independently: nominals, verbals, adverbials, adjectivals, and gerunds (Hafner, 1963).

Not so obvious, however, are the significant structural restrictions of each content subject's material - the syntactic patterns which indicate the interrelationships among words within the immediate sentence and among other sentences throughout the passage. Structural meaning is signalled by functional, syntactical and morphological clues indicated partly by conjunctions, prepositions, articles, auxiliary verbals, and pronominals (Hafner, 1963). Because each subject area's material has its own organization the resulting structural patterns will vary according to the area.

Science material would involve organizational patterns denoting processes such as following directions, hypothesizing, classifying, and problem solving, and so would include structural terms denoting these processes.

Although social studies material includes many of the organizational patterns denoting processes employed in science material, it most commonly involves patterns including terms symbolizing the sequential ordering of events, comparison and contrast, and cause and effect.

Ability to recognize these patterns and the interrelationships of words and ideas which they indicate, appears to be important to the reader's grasp of the intended meaning. Thus, it may be inferred that

effective content reading must involve competence in comprehension of both the lexical and structural aspects of each subject's material.

Measurement of Content Reading Skills

As indicated earlier, many of the skills involved in reading comprehension are interrelated. Consequently, it is difficult to isolate and measure many skills separately.

Most of the currently available silent reading tests are found on the lists of tests selected by Austin, Bush and Huebner (1961, pp. 48-53) for elementary, junior and secondary pupils.

Of the twelve tests on the list selected for upper elementary, ten include sub-tests on general vocabulary, but only one includes as sub-test on word meaning in content areas. All of these twelve silent-reading tests include sections on general comprehension but only one tests reading for details, general significance and understanding directions. One includes a section on reading to organize ideas, and one a section on reading maps and charts.

From the list of fifteen tests selected for junior and senior high school, nine include vocabulary tests, but only one includes technical vocabulary and one includes word meaning in content areas. Although all fifteen tests include sections on general comprehension, only two include sub-tests on directed reading and one on reading maps and charts.

Much of the information concerning pupils' specific content-reading skill development and needs is not revealed by such silent reading tests.

Table I indicated that the two main aspects of comprehension requiring assessment in content reading development are: (1) semantic or lexical meaning (2) syntactic or structural meaning.

Obviously the semantic meaning of a passage cannot be completely isolated from the syntactical meaning, as both types of meaning are interdependent. In spite of this interdependence, however, Rankin (1957) found that it is possible to isolate and thus measure the major semantic and syntactic effects of content. In his experiment, words from each of the two classifications were controlled by means of a modified cloze form which was applied to the test material. Being able to test these two aspects of meaning separately appears to offer significant possibilities, particularly in the content reading field.

II. PURPOSE OF THE STUDY

The foregoing has suggested that the major comprehension demands in content reading are either lexical or structural in nature. Tests that determine how effectively pupils comprehend these two components of meaning in different subject areas should provide the teacher with useful information.

The purpose of this study was to determine whether achievement in cloze tests measuring lexical and structural comprehension of social studies and science material is predictive of pupils' achievement in standardized reading comprehension tests in social studies and science material, taking into consideration the influences of intelligence, sex, chronological age, socio-economic status, and grade.

III. DEFINITION OF TERMS

The following terms are defined operationally for the purpose of this study:

Cloze procedure is a testing technique used for measuring the effectiveness of communication between writer and reader (Taylor, 1953). Subjects are required to supply words which have been systematically deleted from the test material and replaced by underlined blanks. The number of correct cloze responses is an indication of the reader's comprehension of the written passage.

In this study the cloze deletion pattern that is applied to the test material takes two forms: (1) the deletion of every fifth word that fits into the category of structural meaning and (2) the deletion of every fifth word that fits into the category of lexical meaning.

Structural responses are the words inserted in the blanks of cloze-form material indicating deleted words supplying relational meaning or syntactical agreement between words and ideas. In this study these words include conjunctions, prepositions, articles, auxiliary verbals, pronominals.

Lexical responses are the words inserted in the blanks of cloze-form material indicating deleted words supplying semantic value to the material. These words carry within themselves their own meaning, relatively independent of their context. In this study they include nominals, verbals, adverbials, adjectivals, and gerunds.

Intelligence quotients in this study refer to the scores received by students on their group intelligence tests as indicated in their school cumulative record cards.

Socio-economic status indicates a pupil's rating according to the Blishen (1958) Occupational Class Scale, a Canadian index of social class, based on occupation, income, and years of schooling.

General silent reading ability is the achievement indicated by the total score on the Iowa Silent Reading Test, Form Am (Revised), a survey test involving work-study type of comprehension test in social studies and science material.

Social studies comprehension is the achievement indicated by the pupil's score on the social studies section of Sub-test 1, Iowa Reading Test, Form Am (Revised).

Science comprehension is the achievement in comprehension of written science material as indicated by the score obtained on the science section of Sub-test 1, Iowa Silent Reading Test, Form Am (Revised).

IV. HYPOTHESES

For this study the following hypotheses were tested:

1. Ability to comprehend written science material can be predicted by performance in lexical and structural cloze tests.
2. Ability to comprehend written social studies material can be predicted by performance in lexical and structural cloze tests.
3. Silent reading ability can be predicted by achievement in lexical and structural cloze tests.
4. There is a significant difference between the amount of increase in pupils' grade mean test scores in cloze and non cloze comprehension tests between grades 4 and 6 and the increase indicated between grades 6 and 8.
5. Chronological age, intelligence, socio-economic status, grade, and sex, are significant factors in pupil test performance in silent reading, structural and lexical cloze tests.

V. LIMITATIONS OF THE STUDY

1. It must, to some degree at least, be a matter of conjecture that the test sample represents typical grades 4, 6, and 8 pupils.
2. Prescribed time restrictions to which the pupils adhered in the non-cloze tests were comparatively eased for the cloze tests. The introduction of a time variable may have been significant.
3. The social studies and science material used in the cloze tests is mainly narrative in style, and as such, may not be typical of some of the science and social studies material found in text books, particularly at the eighth grade level.
4. The examiner found that the Blishen Occupational Class Scale did not provide sufficient classifications for the indexing of all of the occupations represented by the test sample population. For this reason the usefulness of the scale and its socio-economic status ratings was limited.
5. The sequence in which the cloze tests were administered could have introduced a practice factor which was not considered in the study. The first cloze tests to be administered in both Forms B and C were lexical deletion tests whereas the last were structural. Pupil practice while writing the lexical tests may have been a significant factor in test performance, particularly in Form B where the pupils wrote their first cloze tests.

VI. Significance of the Study

Although the need for effective teaching of content reading skills is being emphasized in schools, there appears to be a lack of understanding

concerning the specific content reading skills involved. Teachers are uncertain as to whether these are general comprehension skills or skills unique to the comprehension of each subject area. They are looking for more effective means of assessing pupils' development in content reading skills. Any procedure that could help teachers further identify skills of content reading, or assist in the assessment of pupils' content reading would be significant.

This study investigated such a procedure. It analyzed pupil performance in cloze tests which tested two important aspects of comprehension in content reading - lexical and structural meaning. The pupils' cloze test results in both science and social studies were analyzed in relation to pupil grade level, reading comprehension ability, chronological and mental age, sex and socio-economic status.

Although similar studies have been carried out using the any-word cloze pattern that involved the deletion of every fifth word regardless of classification, no other study, to the investigator's knowledge, has utilized the modified cloze form that deletes structural words according to Hafner's classification. For these reasons the study is considered significant.

VII. ORGANIZATION OF THE STUDY

The reporting of the remainder of this study is organized in the following manner: Chapter II presents a review of literature related to the study's main areas of concern (comprehension, content reading, and measurement of comprehension). Chapter III describes the design of the study, while the findings are presented in Chapter IV. Chapter V presents the summary of the study's findings, along with the conclusions, implications, and recommendations for further research and practice.

CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter reviews literature related to the three main aspects of the study: reading comprehension, reading in the content area, and the measurement of reading comprehension skills.

I. READING COMPREHENSION

While there are divergent interpretations of the comprehension process, there is also general agreement about many of the elements which are involved. As early as 1917 Thorndike compared the act of comprehending print with that of solving a mathematics problem "...selecting the right elements of the situation and putting them together in the right relations, and also with the right amount of weight or influence or force for each. The mind is assailed as it were by every word in the paragraph. It must select, repress, soften, emphasize, correlate, and organize, all under the influence of the right mental set or purpose or demand." (Thorndike, 1917, p. 329). In 1960 the process was described as a perfect interaction between ocular functions and interpretive factors whereby the reader interprets what he reads in light of his background, associates it with past experiences, and projects beyond it in terms of ideas, judgments, applications, and conclusions (Taylor, Frackenpohl and Pettee). Dechant (1964) accepts these interpretations, but by way of further definition, he describes comprehension as a perceptual

act involving not only seeing and recognizing the printed word but becoming aware of the word's meaning and relating it to the immediate and broader context. This meaningful response rather than the recognition of the printed symbol is what he considers to be the critical element in reading.

Dechant contends that the initial step in the comprehension process involves the reader's association of his own experience with the given graphic symbols. Success in this phase of the communication is dependent on the capacity of the reader and the writer to assign some common meaning to the words. This commonality of meaning obviously implies the need for mutual experience, be it real or vicarious.

Although associating word symbols with meaning is basic to comprehension, it is only an elemental stage in the process. In order to get meaning that is significant, the reader must go on from this literal level of meaning to interpret the words in their contextual setting, as parts of sentences, and paragraphs.

In further elaboration of the use of context clues and the remaining steps in the comprehension process, Spache (1965, p. 18) writes:

"The reader first recognizes words by their form, shape, structural parts, or by the implications of the context. Each word calls forth one or several meaning associations which the reader tries out for appropriateness in this contextual setting. He accepts what seems to be the most relevant meaning or associative thought, and proceeds to the next word, again choosing an association which seems logically related to the preceding word. Various groups of words form cohesive associations as he reads through the elements of the sentence. These groups of ideas or details coalesce into the stated or implied meaning of the sentence. The meanings of successive sentences may be combined inductively into the main idea of the paragraph. In deriving the main ideas of the paragraph, the reader may recognize cause-effect, question-answer, hypothesis-proof, or other relationships

which contribute to the generalization. Or these sentence meanings may form the basis for original deductions, such as implications, or unstated conclusions, or ideas associated with, but tangential to the main idea of the paragraph."

These steps in comprehension are reclassified by Russell (1970, pp. 151-153), who states that a reader may function at four different levels of comprehension: (1) word identification (2) general impression or main idea (3) exact literal meaning (4) interpretation or critical thinking. At the third and fourth levels different kinds of comprehension such as following directions, understanding inferences, and drawing conclusions take place. Russell implies that the most important factor in effective reading comprehension is that of flexibility, of reading in different ways for different purposes.

Writers such as Austin (1961) place emphasis on the factors that create the individuality of the comprehension process of each reader: experiential background, environment, interest, motivation, vocabulary, and intelligence. To this list could be added the learning style of the reader. The Jackson study (1970) indicated that memory is also significant. In this study involving sixth grade pupils, a significant relationship was established between performance in memory (free recall) tests and reading comprehension.

A number of authorities emphasize the significance of similarity between the oral and written language codes of writer and reader. Strickland (1963) describes reading comprehension as a process whereby the stimulus of the printed word is translated back into speech. Carroll (1964) more specifically describes the process as the comprehending of morphemes and the patterns in which they occur in response to some kind of internal representation of the spoken message. Fries (1952) goes even further, describing all writing

as the substituting of patterns of graphic shapes to represent the language signals of the code for sound wave patterns. He emphasizes the fact that a reader can respond to the written meaning signals only in so far as he is able to respond to the meaning patterns of the auditory symbols. In other words, learning to read requires an association between a stimulus (the word) and a response (the meaning) and is most easily brought about when the printed symbol is associated with a spoken word for which the pupil has previously learned a meaning.

Loban (1963), Bernstein (1965), and Strickland (1963) also emphasize the relationship between oral language competence and reading comprehension. They consider the commonality of the oral language codes of the reader and writer, an essential factor in reading comprehension, for without a mutual code, communication or the sharing of meaning between reader and writer can only be partially successful.

The role of context, and the restrictions it places on the reader's understanding of meaning, receives much emphasis from those authorities who consider comprehension a process of decoding meaning from structural and lexical clues signalled from within the context of a passage. For those holding this view, two of the components of reading comprehension that would be considered basic would be: (1) understanding of lexical meaning which is inherent in many words, (2) understanding of structural meaning which is provided by words, morphological and syntactical clues indicating the relationships between words or ideas within or between sentences and paragraphs. Holmes and Singer (1961) found that 77 percent of the variance in reading power could be attributed not only to the reader's

intelligence but to his ability to understand verbal relationships and understand the vocabulary used in the context of the reading material. The importance of the use of context in reading comprehension is confirmed by studies such as that by Voice (1968).

Regardless of the varying and modified interpretation of the complex comprehension process there appears to be general consensus about certain basic aspects. The association of printed word symbols with meaning significant to their context is accepted as basic to reading comprehension. Also accepted is the premise that the process involves a composite of complicated thought-getting skills that are inextricably interrelated. Finally it is agreed that the development of these comprehension skills is dependent on certain factors involving the capacities, background, attitudes and purposes of the reader himself. Russell notes the complexity of the process:

"The different levels of comprehension and the varied kinds of comprehension most of us have to apply in school and out, suggest that reading is a complex process. The complexity of reading may lie partly in perceptual aspects of what we see and in functional aspects of how we use it, but it would seem to lie most of all in the field of comprehension." (Russell, 1970, p. 153).

II. CONTENT READING

The importance of effective content reading, particularly in the science and social studies fields, cannot be overemphasized. However, although authorities agree on the importance of competence in content reading, they do not seem to have reached consensus on what content reading actually involves.

Two main points of view appear to dominate the literature on

content reading. The first, shared by a majority of writers, suggests that there is no general reading comprehension ability applicable to content reading but, rather, many specific reading comprehension skills, somewhat independent of each other, that are peculiar to each subject area (Bond and Tinker, 1957). Illustrative of this viewpoint is Spache's observation that general reading ability does not predict academic success equally well in all academic areas because of the variations in the reading tasks in each area (1965). Similarly Fay (1960) after his study investigating the relationship between specific reading skills and achievement in social studies, science, and arithmetic concluded that the nature of the reading skills demanded by content areas differs radically from subject to subject. For example, the ability to predict outcomes contributed to achievement in social studies but not in science, while general comprehension performance did not contribute to achievement in arithmetic, but did contribute significantly to achievement in science and social studies. From this it would appear that each content area imposes reading comprehension demands that are unique to its own discipline.

Jenkinson, Robertson and Sutherland (1963) indicate some of the unique comprehension demands made by various subject areas. They refer to the main organizational patterns of science material that are created by classifications, explanations, problem-solving, questions and answers, and experiments. Similarly, they point out social studies patterns resulting from the involvement of relationships of cause and effect, sequence, and comparison and contrast.

In chapter one of the present study it was pointed out that the two main areas of difference in content subject material appear

to lie in the lexical and structural aspects of the material. The chief lexical differences are due to each subject's polysemantic and highly specialized terms while the structural differences are, as indicated in the previous paragraph, created by organizational patterns commonly involved in each subject area. Robertson (1965) found that readers' understanding of certain connectives such as "however," "although," "yet," and "therefore," has a definite effect on their reading comprehension. The Davison study (1969) indicated similar evidence involving the understanding of connectives in social studies material. Bormuth (1969) found that the most difficult inter-sentence syntactic structures to comprehend were those involving the words "although," "before," and "while." The material of each subject area is organized in a way common to that subject. Because the organizational patterns of a passage determine, to a large degree, the kinds of connectives it contains, it is obvious that this factor adds to the uniqueness of each subject's material. This unique organization and its resulting organizational patterns would, for those holding this viewpoint, be emphasized in the reading of each subject area.

Supporters of a second viewpoint, however, argue that any uniqueness of a subject's reading demands lies in semantics rather than actual reading skills (Herber, 1970). They view comprehension as merely a generic term embracing many different terms or labels for thought-getting processes (Smith, 1963). These thinking processes take place at different levels of cognition regardless of the content of the material. Herber describes these levels of cognitions as:

- (1) the literal level (at which the reader merely takes in information);
- (2) the interpretive level (at which the reader determines what

the information means), and (3) the applied level (at which the reader makes use of the ideas that have been developed). Reading in any content areas, therefore, involves these three levels of cognition which provide the Gestalt in which the various organizational patterns and reading skills are embodied.

Authorities sharing this view contend that the skills required in one content area are those generally required by other subject areas. With Herber they suggest that in reading at the interpretive level, the reader searches for identifiable relationships or organizational patterns within the text so as to form the intrinsic concepts required at this level of cognition. Similarly, at the applied level, the reader forms new extrinsic concepts as he sees the relationships or organizational patterns of the passage. Usually there is a mixture of patterns - cause/effect, sequence, comparison/contrast, etc. - in all content material. The successful reader is one who can readily transform his basic repertoire of thinking skills to meet the demands of various content areas. Harris (1969), on the other hand, suggests that there are only two kinds of reading in content reading: (1) assimilative reading whereby the reader absorbs and remembers, (2) research reading whereby one begins with a problem and locates sources of information, selects, analyzes, compares, and organizes.

Although the types of reading or specific skills needed for reading in the content fields are often classified, categorized, or arranged differently, by different authorities, this does not, as Hill (1967) suggests, indicate that a great controversy exists. Similarly Spache (1965, p. 17) writes:

There is widespread agreement among leading reading authorities concerning major types of reading in curricular fields and their

respective purposes. A study of their recent writing points up these types of reading: (1) understanding and interpreting content; (2) grasping the organization of the content; (3) developing special vocabularies, concepts, and symbols; (4) evaluating critically what is read; (5) collecting and collating materials; (6) recalling and applying what is read; (7) broadening interests, tastes, and experiences.

Whether the requirements be called reading types or skills, or cognitive levels, there appears to be basic consensus concerning their importance to effective reading in content material. Moreover, there is general agreement that the essential components of variance in content reading include the reader's own psychological set, intellectual capabilities, ability to manipulate language and to reason.

III. MEASUREMENT OF READING COMPREHENSION SKILLS

The interrelated nature of the variables associated with reading comprehension has always made it difficult to isolate and measure individual factors. In addition, no procedures seem to have been devised to measure effectively all of the components of comprehension. As a consequence there is considerable reservation about the usefulness of many existing silent-reading tests in actually identifying pupils' comprehension difficulties or giving an adequate measure of pupils' comprehension development, particularly in content reading.

Traxler (1951) in his survey of silent reading tests found that out of twenty-five different comprehension skills which the tests claim to measure, only one sub-test in one test battery was actually unique. Spache suggests that comprehension is probably not composed of a great variety of skills supposed to be measured by many reading tests. He concludes that, rather, so-called tests of comprehension merely offer labels for some of the outcomes of the comprehension process.

Nevertheless, teachers do need some effective means of assessing pupils' specific comprehension skill development if they are to

provide adequate instruction in content reading. Some authorities advocate broad comprehension assessment areas. Bracken (1964), for example, provides teachers with an appraisal guide in social studies that includes the pupils' oral and silent reading of a paragraph; questioning on main ideas, supporting details, key words, inferences, and generalizations; study habits; inventory on reading versatility which checks pupil's understanding of author's purpose and ability to adjust rate to purpose; specialized abilities required by social studies material (to locate information, grasp information, find information from maps, tables, charts, etc., organize ideas, read critically, recognize propaganda); and use of references. Similarly, Strang (1964) suggests an informal science comprehension ability test which includes the reading of a passage, followed by questioning on what the author said (his best, most complete idea) finding details, drawing conclusions, and, finally, a vocabulary test.

Other authorities emphasize the importance of examining the role played by the content material, in the reader's struggle for comprehension.

Although it has been established that the context of a passage does not yield the complete meaning to the reader, it is an important factor in comprehension and should be regarded as such. As indicated earlier, the main areas of context requiring assessment are those involving lexical and structural meaning. Both lexical and structural elements of context place definite restrictions on the possible meaning of words. These linguistic restraints have two main aspects, according to Fletcher (1959): an outer aspect referring to the semantic and syntactical regularities of language which are imposed by the printed

material itself, and an inner aspect that resides within the reader in the semantic and syntactical habits which he has developed through his own language experience. Both of these aspects of context influence the reader's ability to take advantage of the aid given by context in the selection of words' meaning.

Rankin (1957) found that it was possible to isolate and examine both the semantic and syntactical effects of context. He did this by applying a modified cloze form to Fries' dichotomy of language meaning (1952).

Cloze Procedure

The term "cloze" was coined by Taylor (1954) in reference to the Gestalt concept of closure, and was used as a procedure for the construction of tests to measure the effectiveness of language communication. He defined a cloze unit as any single occurrence of a successful attempt to reproduce accurately a part deleted from a message by deciding, from the context that remains, what the missing part should be. He described the technique further as a method of intercepting a message from a transmitter, mutilating its language patterns by deleting parts and so administering it to the receivers that their attempts to make the patterns whole again would potentially yield a considerable number of cloze units.

Taylor proposed two rationales for the cloze procedure. One he based on the Gestalt concept of closure, and the other on the Information Theory. The Gestalt concept of closure involves the tendency to perpetually close the gap of an incomplete structure in terms of a completed pattern. The Information theorist would describe a

cloze response as the completion of a coding operation in the communication between the encoder (writer) and the decoder (reader).

Making a cloze response is, according to Rankin, a cognitive rather than a perceptual act (1965). Weaver suggests that the term "cloze" is misleading as a designation of this procedure, because it "arouses in the thinker the more common constructs of Gestalt psychology which have always been difficult to apply to verbal situations" (1965, p. 115). He describes as very tenuous the relationship of Gestalt ideas of closure to the cloze procedure; Gestaltists "concentrate on the perceptual," invariably considering closure as a literal closing, while in actuality "there is no evidence that subjects 'close' cloze unites in this literal fashion."

Concerning Taylor's other rationale based on the Information Theory, Weaver suggests that cloze "lends itself very well to a description of a coding operation. If cloze is defined as a coding procedure, many of the constructs of the Information Theory become available to aid in analysis, descriptions are improved and experimental testing becomes more feasible."

A factor analysis of cloze tests by Weaver and Kingston (1963) indicates three factors measured by cloze procedure: verbal comprehension, redundancy utilization, and rote memory. This study indicated that cloze tests are most closely related to the redundancy utilization factor and only moderately related to verbal comprehension. Ruddell (1965) also found cloze tests a measure of redundancy. Bormuth (1969) found that one factor, which he labels as reading comprehension ability, accounted for 77 percent of the variance in cloze tests.

Relatively few studies have been carried out in elementary

grades as cloze has been considered a testing technique best suited to high-school and college levels. Bloomer (1962) states that since a subject must be able to understand all words in the context of a blank space in order to make predictions of the omitted words, he should have at least a junior-high school level of word-recognition in order to make cloze responses. However, some studies have successfully involved elementary pupils: Bormuth's studies (1965, 1968) of grades 4, 5, and 6 pupils and more recently (1970) with grade ones; Brooks' study of mentally retarded elementary pupils (1962); Roosnick's study of grade 6 pupils (1962); Ruddell's study (1965) of grade 4; and Hafner's study of upper elementary grades (1965).

Rankin's study (1959) revealed that cloze procedure appears to be a more accurate measure of specific comprehension skills than of general comprehension, of the process of comprehension rather than the product. Bormuth (1965) also found that cloze tests measure specific comprehension skills and are influenced by the same variables as those which influence multiple-choice questions, which served as his criteria. These influences included the educational level of students, the difficulty and content area of the reading material. Bormuth concluded that cloze is a valid predictor of readability of literary, science, and social-studies material.

The advantages of tests made by cloze procedure are outlined by Bormuth (1968) and Rankin (1969). A cloze test can be made over any passage in any kind of content material, making it possible to use the test in any subject at any grade level. There is no problem concerning the adequacy of the questioning, which is so important in multiple-choice tests. Instead, deletions representing a pre-set

pattern are indicated by blank spaces of a standard length. The test is simple and economical to prepare. It is simple to score, as only the responses exactly matching the deleted words are accepted as correct. One factor that limits the usefulness of the procedure is the lack of a frame of reference by which one can place a value judgment on a cloze test score. Drawing up such a frame of reference was Bormuth's purpose for carrying out his 1968 study.

In this study he compared grades 4, 5, and 6 pupils' performance in Gray's Standardized Oral Reading Check Tests, California Reading Achievement Test and cloze tests. Using Betts' criteria for evaluating pupil performance at different reading levels (1957, pp. 446-451) Bormuth's findings indicated the following comparisons between cloze and non-cloze test scores:

1. The comprehension (non-cloze) test score of 90 percent and the oral reading test score of 99 percent that indicate the minimum test scores required by pupils reading at the basal (independent) reading level, were comparable to cloze test scores of 57 percent and 54 percent respectively.
2. The comprehension (non-cloze) test score of 75 percent and the oral reading test score of 95 percent which indicate the minimum test scores required by pupils reading at the instructional reading level were comparable to cloze test scores of 44 percent and 33 percent respectively.

Any scores lower than these indicated reading at the frustration level.

Bormuth (1968) refers to the development of the cloze technique as a solution to the absence of valid methods of measuring pupils'

reading comprehension difficulties. He also credits it with providing power and flexibility to such measurement.

Although there is still some skepticism about cloze procedure (Weaver, 1965), evidence suggests that the cloze measuring technique may offer promise of assistance to teachers in identifying some of the content reading problems of their pupils.

IV. SUMMARY

A review of the literature indicates that there are many views concerning the complex process of reading comprehension. Although these views are divergent concerning the definitions of terms and the order of steps involved in the comprehension process, they are in agreement concerning the factors that make it an individualized process - the reader's intelligence, interest, experiential background, and ability to understand relationships between the words and sentences in the context of the reading material.

Some authorities view content reading skills as being unique to each subject area. Others suggest that reading skills required in one content field are generally required in other subject areas. There are various types of thinking skills required at different levels of comprehension. The successful reader is one who can readily adjust his thinking skill to meet the levels of comprehension demanded by each subject area.

The difficulty in isolating and measuring the interrelated skills of the comprehension process is not minimized by any one of the authorities. Some emphasize the traditional form of testing by questioning the reader on the various kinds of meaning of test passages. Others emphasize

the need for more objective testing techniques, such as cloze, which mutilate the context of the test material according to pre-set deletion patterns, and tests the reader's response to the different patterns. The cloze technique appears to be able to test separately, the reader's comprehension of the structural and lexical aspects of the context, two important aspects of content reading material.

CHAPTER III

DESIGN OF THE STUDY

This chapter describes the study's test sample, instrumentation, and testing procedure, as well as the statistical procedures used for the analyses of the data.

I. TEST SAMPLE

The testing for this study was carried out in two elementary - junior high schools of the Edmonton Public School Board. The Superintendent's Office granted the investigator permission to administer the tests in these schools which they designated as being representative of the highest and lowest socio-economic levels in the city's public school population.

The original test sample included 300 pupils randomly selected from grades 4, 6, and 8 (100 from each level). However, 12 of the pupils had to be excluded from the sample because they were absent from one or more of the required tests. The final sample included 288 pupils - two classes from each school at each of the grade 4, 6 and 8 levels. At the grade 4 level there were 96 pupils (51 boys and 45 girls); in grade 6, there were 91 pupils (41 boys and 50 girls); and in grade 8, there were 101 pupils (49 boys and 52 girls).

Table II provides a summary of the description of the sample.

TABLE II

DESCRIPTION OF TEST SAMPLE

Variable	GRADE 4	GRADE 6	GRADE 8
Number of Pupils	96 (51 boys, 45 girls)	91 (41 boys, 50 girls)	101 (49 boys, 52 girls)
Average C.A. (in months)	119	143	167
Average I.Q.	115	118	116

II. INSTRUMENTATION AND TESTING PROCEDURE

Testing was carried out in classrooms of the two schools during the period from May 25 to June 13, 1966. The total testing time for each pupil was three hours.

The tests included three forms of the Iowa Silent Reading Test (Elementary; New Edition). The material of Form Am was left in its original form, but that of Forms Bm and Cm was subjected to cloze procedure. Form Am was given in its entirety in order to establish each pupil's silent reading ability score. In Form Bm, only Sub-tests 1A (Science Section) and 1B (Social Studies) were given, the material being mutilated by a cloze pattern which deleted every fifth (or nearest to the fifth) word representing the lexical category of meaning. This category involved only nominals, verbals, adjectivals, adverbials, and gerunds (Rankin, 1957). Similarly in Form Cm, only Sub-tests 1A (Science

section) and IB (Social Studies) were given, the cloze pattern deleting every fifth (or nearest to the fifth) word representing the structural category of meaning, involving conjunctions, pronominals, prepositions, articles and auxiliary verbals (Hafner, 1963).

Table III summarizes the types of test material used in the study. It indicates each form of the Iowa Silent Reading Test administered, whether it was given in cloze or non-cloze form, the skill each test attempts to measure, and the term designated by each test score.

As indicated in Table III, the Iowa Silent Reading Test: is designed to measure pupils' ability to do silent reading. of the work-study type, primarily in science and social studies material.

Reliability coefficients of .93 to .95 are indicated in the test manual, which states that reliability was established by use of the split-half Spearman-Brown procedure and Kuder-Richardson formula No. 21.

The tests were validated by comparing the unit skills measured by each sub-test with an outline of basic silent reading skills.

The reliability of cloze tests has been established by various studies. Taylor (1954) on a test-retest basis, reported a reliability coefficient of .88 (based on an odd-even item count, corrected by the Spearman-Brown formula). By the same measure, Rankin (1957) found a reliability coefficient of enough significance to warrant the use of cloze procedure in the measurement of reading comprehension. Bormuth

TABLE III

DESCRIPTION OF STUDY'S TEST MATERIAL

Test Form (Iowa Silent Reading Test)	Skill that Test Attempts to Measure	Term Used to Indicate Test Score
Form Am: (Non-cloze form)		
Sub-test - 1A	Rate and comprehension in reading science material	Science Comprehension
- 1B	Rate and comprehension in reading social studies material	Social Studies Comprehension
- 2	Directed Reading	
- 3	Word Meaning	
- 4	Paragraph Meaning	
- 5	Sentence Meaning	
- 6	Alphabetizing	
- 7	Use of Index	
<u>Total</u> Form Am Test Score		Silent Reading Ability
Form B: (Cloze form)		
Sub-test - 1A	Response to lexical deletions in science material	Lexical Comprehension of Science Material
- 1B	Response to lexical deletions in social studies material	Lexical Comprehension of Social Studies Material
Form C: (Cloze form)		
Sub-test - 1A	Response to structural deletions in science material	Structural Comprehen- sion of Science Material
- 1B	Response to structural deletions in social studies material	Structural Comprehen- sion of Social Studies Material

(1965), using alternate forms and rational equivalence to calculate reliability, obtained reliability coefficients ranging from .70 to .95. Ruddell (1963) obtained split-half reliability coefficients of .85 to .90 for individual passages, and .95 to .96 on total passages.

Kingston and Weaver (1970) found cloze test scores to be highly valid predictors of Grade I standardized reading scores. There were similar findings from earlier studies - Jenkinson (1957), Ruddell (1963), and Bormuth (1965) - involving pupils of other grade levels. Significant correlations were found between cloze and standardized test scores.

For the present study, data regarding chronological age, intelligence quotients, grade placement, and socio-economic status were obtained from school records.

All but twelve of the pupils' intelligence-quotients were obtained from recorded Otis Mental Ability Test scores.

The socio-economic status of the pupils was established according to the Blishen Occupational Class Scale (1964), a Canadian index of social class based on occupation, income, and years of schooling. This index shows high correlations with Tuckman's scale (1947, p.p. 477-484) the only other available Canadian Scale.

All of the tests for the study were administered and corrected by the investigator. Although the prescribed time limits were observed during the administering of Form Am of the Iowa Silent Reading Test, they were relatively ignored during the administering of Forms B and C (cloze form) so that an adequate number of cloze responses could be completed by even the slowest readers.

In scoring the cloze tests, only the correct lexical and structural responses (not the synonyms) were counted.

TREATMENT OF THE DATA

In testing Hypotheses 1 and 2, a multiple linear regression analysis was the statistical technique used to determine whether achievement in the cloze tests in science material (Sub-test 1A, Form B, and Sub-test 1A, Form C, Iowa Silent Reading Test) predicted the test scores in science comprehension of the non-cloze form material (Sub-test 1A, science section, Iowa Silent Reading Test, (Form A)). Also whether achievement in the cloze tests in social studies material (Sub-test 1B, Form B, and Sub-test 1B, Form C, Iowa Silent Reading Test) predicted the test scores in social studies comprehension in non-cloze form material (Sub-test 1B, social studies section, Iowa Silent Reading Test, Form A).

The Multiple Linear Regression technique requires that a hypothesis be expressed in terms of two linear statistical models. To test the hypothesis, the variance accounted for by each of the two models is compared (Bottenberg, Ward, 1965).

To test Hypothesis 3, establishing whether achievement in silent reading ability (total score of Iowa Silent Reading Test, Form Am) predicted ability in the cloze tests in science, social studies, a multiple linear regression analysis was again carried out.

Testing Hypothesis 4 required a comparison of means, which was carried out by One-Way Analysis of Variance, applying the Scheffe Test for multiple comparison of means.

Testing Hypothesis 5 required multiple linear regression analysis in order to determine the test score contribution made by each of the independent variables: intelligence quotient, chronological age, grade, sex, and socio-economic status.

To show the relationships between the various comprehension scores and the contributing variables at each grade level, Pearson product-moment correlation coefficients were calculated and their significance was determined by 't' test.

SUMMARY

Data for this study were collected by the investigator during the period of May 25 to June 13, 1966. The test sample of 288 pupils was selected randomly from 300 grades 4, 6, and 8 pupils in two schools representing the highest and lowest socio-economic levels of the Edmonton Public School population. The tests were administered and corrected by the investigator.

The tests included three forms of Iowa Silent Reading Test (Elementary: New Edition). Form Am was left in its original form, but Forms Bm and Cm were subjected to cloze procedure. In Form Bm, Sub-test 1A (science) and Sub-test 1B (social studies) were mutilated by a cloze pattern deleting every fifth word (or nearest to the fifth) representing the lexical category of meaning. In Form Cm, Sub-test 1A (science) and Sub-test 1B (social studies) were mutilated by a cloze pattern deleting every fifth (or nearest to the fifth) word representing the structural category of meaning.

Data on chronological age, intelligence, grade placement, and socio-economic status were obtained from school records. To establish whether cloze test performance predicted ability to comprehend science and social studies material and general content reading ability, multiple linear regression analysis was carried out. The contribution of chronological age, intelligence, and socio-

economic status to performance in content reading was also determined by multiple linear regression analysis. Correlations between the variables and pupil test performance at each of the 4th, 6th and 8th grade levels were calculated. The difference between the 4th and 6th grade and the 6th and 8th grade mean test scores were compared by One-Way Analysis of Variance.

CHAPTER IV

FINDINGS OF THE STUDY

In this chapter the results of the statistical treatment of the test data will be examined as they pertain to the following aspects of the study: the predictability of achievement in science and social studies comprehension by cloze test performance; a comparison between the increase in mean test scores that is evident between grades 4 and 6 and that is evident between grades 6 and 8; the effect of the different variables on pupils' test performance.

I. THE PREDICTABILITY OF ACHIEVEMENT IN SCIENCE AND SOCIAL STUDIES COMPREHENSION BY PERFORMANCE IN CLOZE TESTS

In order to determine whether science comprehension ability can be predicted by lexical and structural cloze test scores, the relationships between the predictor variables (cloze test scores) and the criterion variable (science comprehension scores) were analyzed by means of multiple linear regression analysis. The significance of the predictions made by the cloze test scores of the total test sample (N=288) was tested by the calculating of F ratios, significant at the .01 level of probability.

The combined influence of intelligence, socio-economic status, sex, and grade was included in the analysis, the results of which are summarized in Table IV.

TABLE IV

PREDICTABILITY OF ACHIEVEMENT IN SCIENCE
COMPREHENSION BY CLOZE TEST PERFORMANCE

<u>Prediction Variable</u>	<u>df</u>	<u>F Ratio</u>
Ability to Make Correct Lexical Responses	1/283	12.5116**
Ability to make correct Structural Responses	1/283	26.9387**

** significant at the .01 level (N = 288)

As seen in Table IV, performance in both lexical and structural cloze tests is a significant predictor of reading comprehension in science. Hypothesis I, which stated that ability to comprehend written science material can be predicted by performance in lexical and structural cloze tests, was therefore accepted.

In order to determine whether ability in social studies comprehension can be predicted by performance in cloze tests, multiple linear regression analysis was again carried out. The results of this are summarized in Table V.

TABLE V

PREDICTABILITY OF ACHIEVEMENT IN SOCIAL STUDIES
COMPREHENSION BY CLOZE TEST PERFORMANCE

<u>Prediction Variable</u>	<u>df</u>	<u>F Ratio</u>
Ability to Make Correct Lexical Responses	1/283	17.8314**
Ability to Make Correct Structural Responses	1/283	24.4839**

** significant at the .01 level (N = 288)

Table V indicates that performance in both lexical and structural cloze tests is a significant predictor of reading comprehension in social studies. Hypothesis II, which stated that ability to comprehend social studies material can be predicted by performance in lexical and structural cloze tests, was therefore accepted.

Similarly, by means of a multiple linear regression analysis which is summarized in Table VI, it was established that performance in structural and lexical cloze tests is also a predictor of silent reading ability.

TABLE VI

PREDICTABILITY OF SILENT READING ABILITY BY PERFORMANCE
IN LEXICAL AND STRUCTURAL CLOZE TESTS

<u>Prediction Variable</u>	<u>df</u>	<u>F Ratio</u>
Ability to Make Correct Lexical Responses	1/283	51.4023**
Ability to Make Correct Structural Responses	1/283	56.0508**

** significant at the .01 level

Because performance in both lexical and structural cloze tests appeared to be significant predictors of general silent reading ability, Hypothesis III, which stated that silent reading ability can be predicted by performance in lexical and structural cloze tests, was accepted.

To further investigate the relationships between achievement in comprehension and performance in cloze tests, Pearson product-moment correlation coefficients were calculated at each of the three grade levels.

Table VII indicates the correlations between test performance in cloze and non-cloze tests in science. Ability to make correct lexical responses correlated significantly with science comprehension at all three grade levels. However, the correlations between structural cloze test performance and science comprehension were significant at only the grades 4 and 6 levels.

TABLE VII

CORRELATION BETWEEN ACHIEVEMENT IN SCIENCE
COMPREHENSION AND CLOZE TEST PERFORMANCE

Pupil Grade Level	Correlation Between Test Performance in Science Comprehension and Cloze	
	<u>Lexical Cloze Form</u>	<u>Structural Cloze Form</u>
IV	.240**	.494**
VI	.288**	.265**
VIII	.286**	.159
Total	.575**	.627**

** significant at the .01 level

Table VIII shows the correlation between pupil achievement in the cloze and non-cloze tests in social studies. It will be noted that the correlations are again significant at the grades 4 and 6 levels. However, at the grade 8 level no significant correlation between structural cloze test performance and social studies comprehension was noted. This would seem to indicate that by the eighth grade level pupils appear to have reached a ceiling in their development in understanding structural meaning in both science and social studies material. Development in understanding of lexical meaning, however, appears to continue as a significant factor in comprehension, even at the eighth grade level.

TABLE VIII
CORRELATION BETWEEN ACHIEVEMENT IN SOCIAL STUDIES
COMPREHENSION AND CLOZE TEST PERFORMANCE

Pupil Grade Level	Correlation Between Test Performance in Social Studies Comprehension and Cloze	
	<u>Lexical Cloze Form</u>	<u>Structural Cloze Form</u>
IV	.413**	.504**
VI	.415**	.323**
VIII	.243**	.221
Total	.536**	.552**

** significant at the .01 level

Table IX indicates correlations between silent reading ability, as indicated by the total test score of the Iowa Silent Reading Test, Form Am, and performance in the lexical and structural cloze tests in science and social studies. It is noted that the correlation between structural cloze test performance and silent reading ability decreases as pupils progress from the fourth to the eighth grade level. However, the relationship remains significant, even at the eighth grade level. It is also noted that performance in structural cloze tests has a higher correlation with ability in reading comprehension of social studies than of science at the 4th, 6th, and 8th grade levels. Similarly, performance in lexical cloze tests remains a more significant factor in social studies than in science reading comprehension ability.

TABLE IX

CORRELATION BETWEEN ACHIEVEMENT IN SILENT READING
AND CLOZE TEST PERFORMANCE

Pupil Grade Level	Correlation Between Silent Reading Ability and Performance in Cloze Tests			
	<u>Lexical Cloze Form</u>		<u>Structural Cloze Form</u>	
	Science	Soc. Studies	Science	Soc. Studies
IV	.356**	.466**	.488**	.609**
VI	.551**	.593**	.351**	.452**
VIII	.399**	.422**	.270**	.346**
Total	.737**	.770**	.690**	.742**

** significant at the .01 level

In summarizing the data concerning the test sample as a whole, performance in both the structural and lexical cloze tests significantly predicted pupil ability in science and social studies comprehension. Similarly, cloze test performance predicted general silent reading ability in content material.

Relating to the test sample by grade level, significant correlations were indicated between lexical cloze test performance and ability to comprehend science and social studies material at the grades 4, 6 and 8 levels. Correlations between structural cloze test performance and science and social studies comprehension ability were significant at only the 4th and 6th grade levels. However, correlations between both lexical and structural cloze test performance and

ability in silent reading were significant at the grades 4, 6 and 8 levels.

II. COMPARISON OF INCREASE IN GRADE MEAN TEST SCORES BETWEEN GRADES FOUR AND SIX AND SIX AND EIGHT

Hypothesis IV stated that there is a significant difference between the increase in grade mean test scores between the levels of grade 4 and 6 and that indicated between grades 6 and 8. For the testing of this hypothesis, comparisons of grade mean test scores were calculated by One-Way Analysis of Variance using the Scheffe test as a multiple comparison of means. Table X gives a summary of these comparisons. The probability level for accepting the hypothesis was .01.

TABLE X

COMPARISON OF INCREASE IN GRADE MEAN TEST SCORES
BETWEEN GRADES 4 AND 6 AND GRADES 6 AND 8

	Gr. 4 Mean Test Score	Gr. 6 Mean Test Score	Gr. 8 Mean Test Score	Probability associated with Gr. 4-6 difference of means	Probability associated with Gr. 6-8 difference of means
Science Comprehension	4.7917	7.4615	8.1980	<.001	.031
Social Studies Comprehension	5.0625	6.7253	7.5248	<.001	.025
Science Cloze (Lexical)	9.2604	25.3187	41.0396	<.001	<.001
Social Studies Cloze (Lexical)	12.3958	24.7472	36.4158	<.001	<.001
Science Cloze (Structural)	41.4063	53.1978	57.7822	<.001	<.001
Social Studies Cloze (Structural)	5.3333	8.0000	10.3564	<.001	<.001

Table X indicates that test performance in the lexical and structural cloze tests improved significantly as pupils progressed from 4th to 6th grade level and from 6th to 8th grade level. Although growth in non-cloze test performance was also significant between the 4th and 6th grade levels, there is no indication of such significant growth between the 6th and 8th grade levels. Hypothesis IV is, therefore, accepted, except as it relates to growth in achievement in science and social studies comprehension tests in non-cloze form between the 6th and 8th grade levels.

III. INFLUENCE OF CHRONOLOGICAL AGE, INTELLIGENCE, SOCIO-ECONOMIC STATUS, GRADE, AND SEX ON ACHIEVEMENT IN SCIENCE AND SOCIAL STUDIES COMPREHENSION, LEXICAL AND STRUCTURAL CLOZE TEST PERFORMANCE, AND GENERAL SILENT READING ABILITY

A multiple linear regression analysis revealed significant relationships between the predictive variables (chronological age, intelligence, socio-economic status, grade, and sex), and the criteria variables (performance in science and social studies comprehension tests, lexical and structural cloze tests, and the silent reading ability test). A summary of this analysis is shown in Table XI indicating levels of probability of significant contribution by independent variables to pupils' test performance in the cloze and non-cloze tests. The probability level for rejecting the hypothesis was .001. This analysis relates to the total test population.

Hypothesis V states that the independent variables (intelligence quotient, chronological age, grade, socio-economic status and sex) make significant contribution to pupil achievement in either the cloze or non-cloze tests. In view of the information summarized in Table XI, Hypothesis V was accepted on the following bases:

1. Intelligence proved to be a significant factor in pupil performance in all of the tests.
2. Grade was significant to performance in all except the non-cloze social studies test.

Hypothesis V was rejected on the following bases:

1. Socio-economic status appeared to make no significant contribution

to performance in any of the tests except the structural-cloze test in social studies.

2. Sex was not a significant factor in achievement in any of the tests except the non-cloze science test and the structural-cloze social studies test.

To further investigate the relationships between the variables and test performance, correlations between the variables and achievement in the cloze and non-cloze comprehension tests were calculated in science and social studies at the 4th, 6th, and 8th grade levels. The significance of the correlations was determined by 't' tests. Tables XII and XIII summarize the correlations.

TABLE XI

PROBABILITY OF CONTRIBUTION OF INDEPENDENT
VARIABLES TO TEST PERFORMANCE

(N = 288)

Test Performance	Probability of Contribution by Variable			
	I.Q.	Soc-Ec. Status	Grade	Sex
Science (Non-cloze)	.003	.002	<.001	.006
Social Studies (Non-cloze)	<.001	.264	.072	.088
Science Lexical (Cloze)	<.001	.044	<.001	.021
Social Studies Lexical (Cloze)	<.001	.485	<.001	.442
Science Structural (Cloze)	<.001	.151	<.001	.046
Social Studies Structural (Cloze)	<.001	<.001	<.001	.014
Silent Reading (Non-cloze)	<.001	1.000	<.001	.049

TABLE XII

CORRELATION BETWEEN INDEPENDENT VARIABLES AND SCIENCE
COMPREHENSION TEST SCORES

Independent Variable	Correlation With Science Comprehension Test Scores								
	Non-cloze			Cloze (lexical)			Cloze (structural)		
	Gr. 4	Gr. 6	Gr. 8	Gr. 4	Gr. 6	Gr. 8	Gr. 4	Gr. 6	Gr. 8
Chronological age	.16	.02	.11	.27**	.14	.25**	.30**	.29**	.18
I.Q.	.22	.31**	.22	.09	.51**	.50**	.30**	.49**	.47**
Socio-economic Status	.27**	.08	.21	.10	.12	.20	.27**	.05	.17
Silent Reading Ability	.54**	.44**	.43**	.36**	.55**	.40**	.49**	.35**	.27**

** significant at .01 level

Table XII indicates a significant correlation between intelligence and performance in both the cloze and non-cloze tests in science material at the grade 6 level. At the grade 4 level, however, the correlation appears significant between intelligence and performance in only the structural cloze test while at the grade 8 level it appears significant with performance in only the structural and lexical cloze tests. It would appear that at the grade 4 level intelligence plays a bigger role in the understanding of the overall meaning of the science passages as indicated by the structural terms than it does in the understanding of lexical meaning.

A significant correlation appears evident between pupils socio-economic status and their performance in both non-cloze and structural tests in science at the grade 4 level. This correlation was not noted as significant at the grades 6 and 8 levels.

TABLE XIII

CORRELATION BETWEEN INDEPENDENT VARIABLES AND SOCIAL
STUDIES COMPREHENSION TEST SCORES

Independent Variable	Correlation With Social Studies Comprehension Test Scores								
	Non-cloze			Cloze (lexical)			Cloze (Structural)		
	Gr. 4	Gr. 6	Gr. 8	Gr. 4	Gr. 6	Gr. 8	Gr. 4	Gr. 6	Gr. 8
Chronological Age	.19	.13	.09	.26**	.24	.12	.27**	.30**	.15
I.Q.	.22	.47**	.21	.36**	.58**	.51**	.32**	.51**	.40**
Socio-economic Status	.20	.13	.07	.39**	.07	.12	.35**	.30**	.19
Silent Reading Ability	.47**	.50**	.43**	.47**	.59**	.42**	.61**	.45**	.35**

** significant at .01 level

Table XIII indicates at the grade 4 level a significant correlation again appears evident between socio-economic status and performance in both of the social studies cloze tests. Except for the significant correlation shown between socio-economic status and performance in the structural cloze tests at the grade 6 level, however, no other correlation appears to exist between socio-economic status and performance in any of the social studies tests (cloze or non-cloze) in grade 6 or 8.

TABLE XIV

CORRELATION BETWEEN INDEPENDENT VARIABLES
AND TEST PERFORMANCE IN SILENT READING

Independent Variable	Correlation With Silent Reading Test Scores		
	<u>Grade 4</u>	<u>Grade 6</u>	<u>Grade 8</u>
Chronological Age	.29**	.28**	.27**
I.Q.	.11	.60**	.43**
Socio-economic Status	.14	.21	.03

** significant at .01 level

Table XIV indicates that there is no evidence of significant correlation between silent reading ability and socio-economic status at any grade level. Intelligence, however, is significantly correlated with silent reading ability at the grade 6 and 8 levels.

IV. SUMMARY

An analysis of the study's findings indicated that pupils' performance in science and social studies comprehension tests can be predicted by their performance in cloze tests involving either structural or lexical deletion patterns. Cloze test performance was found to also predict ability in general silent reading.

Pupils' achievement in lexical cloze tests was related significantly to their achievement in science and social studies comprehension at the grades 4, 6, and 8 levels. However, their performance in

structural cloze tests correlated significantly with achievement in science and social studies comprehension at only the grades 4 and 6 levels.

In both lexical and structural cloze test performance pupil improvement was significant between grades 4 and 6, and grades 6 and 8. However, in non-cloze test performance, the evident improvement was significant between only the grade 4 and 6 levels.

Analysis of the data also revealed that the independent variables (chronological age, intelligence, socio-economic status, grade and sex) played varying roles of significance in test performance. Intelligence appeared significant in pupil performance in all of the tests, while grade placement was a significant factor in performance in all but the structural cloze test in social studies. Socio-economic status appeared significant to only structural cloze test performance in science, while sex appeared a significant factor in achievement in the science comprehension test and the structural cloze test in social studies.

CHAPTER V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

I. SUMMARY

The purpose of this study was to examine, at the grade 4, 6 and 8 levels, pupil performance in science and social studies comprehension tests in cloze and non-cloze form, with particular attention being given to the following:

1. The predictability of achievement in comprehension of science and social studies material by performance in lexical and structural cloze tests.
2. A comparison of pupil growth in performance in cloze and non-cloze comprehension tests, between grades 4 and 6, and grades 6 and 8.
3. The influence of grade, intelligence, sex, and socio-economic status on pupil achievement in cloze and non-cloze tests.

The test sample included 288 pupils randomly selected from two elementary-junior high schools, representing two different socio-economic areas of the Edmonton Public School system. These pupils were given three forms of the Iowa Silent Reading Test (Revised). Form A was given in non-cloze form, in its entirety, its total score indicating pupils' general silent reading ability, while its Sub-tests 1A and 1B scores indicated comprehension ability in science and social studies respectively. In Form B, Sub-tests 1A

and 1B were given in cloze form involving the systematic deletion of every fifth word fitting the lexical meaning classification. The test scores indicated the pupils' ability in lexical comprehension of science and social studies material. In Form C, Sub-tests 1A and 1B were given in cloze form involving the deletion of every fifth structural meaning word. The Form C test scores indicated the pupils' ability to comprehend structural meaning in science and social studies material.

Hypotheses involving the prediction of pupils' achievement in science and social studies comprehension tests by performance in lexical and structural cloze tests were tested by a multilinear regression analysis. Comparison of pupil growth in cloze and non-cloze test achievement between the 4th and 6th and the 6th and 8th grade levels were made by means of a one-way analysis of variance using the Scheffe test for a multiple comparison of means. The effect of the variables (intelligence, grade, sex, and socio-economic status) on performance in both cloze and non-cloze comprehension tests was analyzed by means of multiple linear regression. The significance of the relationships between the variables and test performance was computed at the different grade levels by means of 't' tests.

II. MAIN FINDINGS AND CONCLUSIONS

The study's main findings and conclusions are organized and presented around three major problem areas.

Problem I

What is the predictability of pupil achievement in comprehension tests in silent reading, science, and social studies, by

performance in lexical and structural cloze tests?

In order to investigate this problem, three null hypotheses were tested.

Hypothesis One

Ability to comprehend written science material can be predicted by performance in lexical and structural cloze tests.

This hypothesis was accepted as the data indicated that significant predictions of achievement in science comprehension were made by both lexical and structural cloze test performance. However, performance in the structural cloze tests was the more significant predictor of the two. This would seem to indicate that structural terms involved in the processes common to science are more difficult for pupils to comprehend than the lexical terms, which are usually considered a source of difficulty in science comprehension.

Hypothesis Two

Ability to comprehend written social studies material can be predicted by performance in lexical and structural cloze tests.

The second hypothesis was also accepted as findings indicated that cloze test performance is also a significant predictor of social comprehension ability. To understand the lexical meaning of the context was, however, more important to the comprehension of social studies than of science.

Hypothesis Three

General silent reading ability can be predicted by achievement in lexical and structural cloze tests.

Hypothesis three was accepted as performance in both

structural and lexical cloze tests was found to be a significant predictive factor in general silent reading ability. As the silent reading test used in the study emphasized study skills and the comprehension of science and social studies material, its score indicated content reading ability. The cloze tests appear to measure content reading skills similar to those measured by the general content reading test.

Correlations between the cloze and non-cloze comprehension test scores indicated the following findings:

1. The relationships between performance in structural cloze tests and the non-cloze tests in science and social studies were significant at the 4th and 6th grade levels.
2. The relationships between performance in lexical cloze tests and non-cloze tests in science and social studies remained significant from grade 4 to grade 8.

Findings from the testing of the first three hypotheses indicated that performance in structural and lexical cloze tests is a reliable predictor of ability in general content reading as well as in science and social studies comprehension.

Problem 2

What is the comparison between the improvement in pupil performance in cloze and non-cloze tests during grades 4-6 and during grades 6-8?

This problem was investigated by testing the fourth hypothesis.

Hypothesis Four

There is a significant difference between the increase in grade mean test scores indicated between the 4th and 6th grade levels

and that indicated between the 6th and 8th grade levels.

This hypothesis was rejected in view of the indications of continual growth in lexical and structural comprehension ability in pupils between the 4th and 8th grade levels. Significant increases in grade means were made between grades 6 and 8 in both lexical and structural cloze test scores, indicating a development aspect in the comprehension of structural and lexical meaning. However, in non-cloze test scores, no significant increase in grade means was indicated between the 6th and 8th grade levels, and the hypothesis was rejected. This would seem to indicate that the cloze tests measure a developmental aspect in comprehension ability that multiple-choice questioning does not appear to measure.

Problem 3

What is the influence of grade, intelligence, sex and socio-economic status on pupil achievement in cloze and non-cloze tests?

The investigation of this problem necessitated the testing of Hypothesis Five.

Hypothesis Five

Chronological age, intelligence, grade, sex and socio-economic status are significant factors in pupil achievement in lexical and structural comprehension and general silent reading.

The contribution of each of the independent variables to pupil achievement in lexical and structural comprehension tests and in the general silent reading test varied according to content area and grade level. Data analysis indicated that intelligence was a significant influence in all test performance except in the lexical cloze test in social studies material at the 4th grade level.

School grade placement also appeared significant to achievement in all but the social studies (non-cloze) comprehension test. Socio-economic status was found to be a contributing factor in performance in the structural cloze test in social studies. In fact, at the 4th grade level, there was a higher correlation between socio-economic status and performance in the social studies cloze (structural) test than there was between intelligence and test performance. However, socio-economic status decreased in importance until it reached insignificance at the 8th grade level. These findings indicated that, along with intelligence and school grade placement, the factor of socio-economic status is significant to pupil achievement in both cloze and non-cloze comprehension tests, particularly at the 4th grade level.

For these reasons Hypothesis 5 was accepted except as it related to the factor of socio-economic status.

III. IMPLICATIONS

The conclusions drawn from this study suggest the following implications.

1. Structural and lexical cloze tests appear to measure the two aspects of context that form the main areas of uniqueness in each content subject's material. Consequently, teachers should be able to rely on such tests to indicate basic content reading needs of pupils in different subject areas. The ease with which these cloze tests can be applied to any content material adds to their potential usefulness in the classroom. However, the tests would be useful only if teachers translate the scores into meaningful information which could be used in planning an instructional program. The scores would become meaningful only if the pupils' individual cloze responses were studied and assessed. Whether content

reading is taught as a series of specific reading skills unique to each subject area or as general reading skills applicable to any type of content material, it would seem that the emphasis should be placed on pupils' understanding of not only the specialized lexical terms unique to each subject area but also the structural terms that symbolize the organizational patterns and thought processes common to each subject area.

2. The study's findings indicate that, at the 4th grade level, economic status can be a significant factor in pupil comprehension of structural meaning in science material. This indicates a need for special instruction in the understanding and use of structural terms and the organizational patterns and thought process they symbolize, for those pupils whose language experience may be limited. The significance of this language deficiency should be considered when teachers are planning their content reading programs and their science programs.

3. As there appears to be a developmental aspect to the growth of pupil ability in comprehension of structural and lexical meaning between grades 4 and 6, the teaching of structural and lexical comprehension skills seems warranted during these grades. However, at the 8th grade level a ceiling appears to have been reached in the comprehension of structural meaning as it no longer seems a significant factor in comprehension. This would seem to indicate that the teaching of only lexical meaning is warranted after the 6th grade level.

4. In science and social studies, the administering of lexical and structural cloze tests rather than the usual content questions might assist pupils (and teachers) to focus on the lexical and structural aspects of meaning. This procedure could be effective in both the teaching and testing of a content reading program.

IV. SUGGESTIONS FOR FURTHER RESEARCH

1. Experimentation is needed with two different types of content reading program aimed at the development of structural and lexical comprehension at different grade levels. One program could emphasize lexical and structural comprehension development as the learning of meanings of isolated lexical and structural words to be applied to any type of content material. The other program could teach the terms as symbols of organizational patterns and thought processes which are a basic part of the content subject itself. In this program the emphasis would be placed on the patterns and processes rather than the terms symbolizing them.

2. Little is yet known concerning the lexical and structural cloze responses of (1) problem readers, (2) effective readers in science and social studies material. A study could reveal significant differences.

3. The present study found that structural comprehension was a more significant factor in content reading ability at the 4th grade level than at the 8th grade level. Research is required on the effect of instruction in lexical and structural comprehension at different grade levels.

V. CONCLUDING STATEMENT

In this study the cloze test performance of grades 4, 6, and 8 pupils in social studies and science material was examined in relation to the pupils' ability to comprehend social studies and science material written in non-cloze form. The skills indicated by pupil

achievement in the cloze tests which measured lexical and structural comprehension, were found to be significant factors in content reading ability.

Data analysis indicated that performance in both the structural and lexical cloze tests gave a reliable prediction of pupils' reading ability in science and social studies material. Although performance in tests of lexical comprehension was more predictive of ability to comprehend social studies than science material, performance in structural comprehension was the more significant predictor of both social studies and science comprehension.

As indicated in the beginning of the study, lexical and structural aspects of content provide the main areas of uniqueness in each content subject's material. These significant areas can be tested by the modified cloze form used in the present study and which proved to be reliable in measuring pupils' reading comprehension ability in science and social studies material at the 4th, 6th and 8th grade levels.

This would suggest that by subjecting any science or social studies material that pupils are about to study to this form of cloze procedure, a teacher could determine each pupils' needs and abilities in these two significant comprehension areas before attempting to use the content material. This would not give the teacher a mere readability index for the subject material, but rather, a detailed account of the specific structural and lexical terms that would prevent each pupil from understanding the material.

Although it is customary to teach pupils many of the unfamiliar lexical terms in content reading, it is not common for a

teacher to consider as important the teaching of structural terms that are actually even more significant in the comprehension of science and social studies. A simple testing procedure such as this modified cloze form, which could readily be applied to any specific content material, would help to focus teacher's attention on both the lexical and structural meaning for which the pupils are reading. In this way, content reading instruction could become a more tangible and meaningful activity.

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APPENDIXES

APPENDIX A

IOWA SILENT READING TEST, FORM B, SUB-TEST 1,
SUBJECTED TO CLOZE PROCEDURE INVOLVING
LEXICAL DELETIONS

SUGAR CANE

Sugar is made from _____ different kinds of _____.
In the United States, sugar _____ is one of the _____
plants from which we _____ sugar. In the sugar-cane _____,
the stalks or canes are _____ like those of the _____ corn.
For this _____ it is sometimes called a _____ of the Indian
_____. The plant grows _____ in a tropical or very _____
climate.

In preparing the _____ for the planting, it is _____
plowed. Ridges are then _____ up from six to _____ feet
apart. A Swallow _____ is made in the _____ of each ridge.
Two or _____ rows of jointed sections _____ from the main
stalk are _____ end to end in this _____. On large plantations
machines _____ the stalks. In the smaller _____ men with hoes
do the _____.

Several canes bearing grass-like _____ grow from each _____.
The plants grow rapidly under the _____ of the Southern sun. By
_____ time they reach a _____ of from five to twenty _____
and a diameter of about _____ inches. For a _____ of years
the cane will _____ up from the same _____, but gradually it
becomes _____ in quality. The old _____ is then plowed _____
and new cuttings are planted. _____ labor is plentiful, the
_____ is done each _____. In Louisiana the stubble will _____
a good crop the _____ or even the third _____.

Harvesting usually begins in _____. It is better to _____ the cane _____ just as long as possible to _____, for sugar forms in the _____ of the cane most _____ in the latter _____ of the life of the _____ stalk. However, it must be _____ before frost injures the _____ of the juice in the _____. When the canes are _____, they are taken in _____ to the mills, where the juice is _____ out by running the _____ through heavy rollers. The _____ stalks are used as fuel for the _____ which run the mills.

The _____, which is a yellowish-green _____ having a pleasant odor, is _____ strained and boiled until it _____. The molasses which we _____ in our homes is _____ from the first boiling of the _____. Raw sugar is not _____ until a more careful refining of the _____ has taken place.

SUB-TEST 1, PART B (SOCIAL STUDIES)

STORMING A CASTLE IN OLDEN TIMES

In olden times, no _____ was safe unless he could _____ himself with his own _____ arm or the _____ of his followers. _____ the home of a _____ had to be well _____. Most of the great _____ of that time were _____ on high, rocky points _____ a river or _____. In this way they could be _____ surrounded by a moat, or _____ ditch filled with water. _____ moat could be crossed _____ by means of a _____. The enemy thus would _____ it very difficult to _____ the castle. The castle _____ were usually built of _____ stone and were very _____ and thick.

After _____ at the ruins of one of these _____ castles and seeing how they were _____, it is easy to _____ why only the bravest _____ ever tried to _____ one of them. The _____ way, if the foe could _____ the time, was to _____ siege to the castle. This _____ surrounding it, cutting off its _____ supply, and waiting until those _____ were starved into _____. However, if the _____ could not wait to _____ the castle by siege, there _____ three common and usually _____ methods.

One way was to _____ to batter down the _____ or gates by _____ of a machine called a _____. This usually consisted of a _____ iron-headed beam slung on _____ between towers on wheels.

These _____ were moved up close to the _____ by the enemy. _____ the iron head of the _____ was crashed into the _____ or against the walls.

_____ the walls were too _____ to be broken _____ by this battering-ram. _____ the enemy must use his _____ method of attack. This _____ that he must _____ to the top of the _____ and overpower the _____. For this purpose a _____ wooden tower as _____ as the castle walls was _____ and set on _____. The moat was then _____ with rocks and trees to _____ a roadway. Then the _____, filled with men, was _____ across the moat and _____ to the wall. The _____ it was near the _____, a drawbridge was let _____ from the top of the _____ to the wall. The _____ rushed across, and the _____ was on. Of course, the _____ of the castle were not _____. Heavy stones were _____ upon the tower to _____ it. Often they tried to _____ it and the men by _____ blazing tar and _____ upon the tower.

Another _____ of attack was to _____ to undermine the _____ of the castle. If the _____ rested on rock, this _____ of attack was usually not _____. But if the walls were _____ on soft soil, it was _____ possible for the _____ to dig an underground _____ under the very _____ of the walls. The _____ of the passage was _____ by heavy beams. These _____ the roof from caving _____ while the digging was _____ on. Later these beams were _____ on fire, with the _____ that the top of the

_____ would fall in and with it the _____ of the
wall above it. _____ this break in the _____ the enemy
would _____, with a good _____ of winning a victory.

APPENDIX B

IOWA SILENT READING TEST, FORM C, SUB-TEST 1,
SUBJECTED TO CLOZE PROCEDURE INVOLVING
STRUCTURAL DELETIONS

APPENDIX B

IOWA SILENT READING TEST, FORM C, SUB-TEST 1,
SUBJECTED TO CLOZE PROCEDURE INVOLVING
LEXICAL DELETIONS

SUB-TEST 1, PART A (SCIENCE)

DICTATING MACHINES

In a modern business office many letters _____ written daily. In some offices _____ letters are dictated to _____ stenographer. As it is impossible _____ write as rapidly as _____ average person talks, _____ stenographer uses a special system _____ writing. Letters, orders, _____ other instructions are frequently dictated _____ a secretary who writes _____ down in shorthand. Later _____ shorthand notes are transcribed _____ presented in typewritten form.

Many business offices now make use _____ mechanical devices to carry _____ their work. One of _____ widely used instruments _____ take the place of _____ shorthand writer is _____ dictating machine. This machine _____ first invented by Thomas A. Edison. There _____ several different makes _____ dictating machines used _____ offices today. In general, _____, these dictating machines _____ based upon the same principles.

_____ a person wishes _____ dictate material which _____ wants to be put _____ writing, he speaks into _____ mouthpiece of the machine. _____ voice is recorded upon _____ revolving wax cylinder. When _____ person completes his dictation _____ cylinder is given to _____ typist.

She places this cylinder _____ a machine known as _____ transcribing machine. This machine reproduces _____ speech that is recorded _____ the wax cylinder. By using _____ set of ear phones _____ is able to listen _____ the voice of the recorder. _____ she listens she types _____ words as she hears _____. Later the

surface of _____ cylinder is cleared by _____ another machine known as _____ shaving machine. In this way _____ is possible to use _____ same cylinder for several recordings.

_____ person dictating to the machine _____ correct an error and _____ any time listen to _____ he has said. He _____ also speak at any convenient rate _____ speed and pause as often _____ necessary. By means of _____ dictating machines the time _____ the stenographer taking the notes _____ be saved. Letters may _____ dictated while the typist _____ busy writing other letters, _____ when the regular staff _____ off duty. The accuracy _____ the material may _____ checked before it _____ typewritten.

Dictating machines _____ more widely used _____ the large concerns than _____ the small office. _____ initial cost of _____ dictating machine is high. Often _____ is enough to keep _____ small office from using it.

SUB-TEST 1, PART B (SOCIAL STUDIES)

THE SPANISH CONQUISTADORS

When Cortez led the Spanish army _____ Mexico City he found great riches _____ he claimed by right _____ conquest. For over twenty years _____ Spaniards plundered the wealth _____ the country which _____ called New Spain. However, _____ were constantly looking _____ other places in _____ gold and silver might _____ found in larger quantities. Stories _____ wealthy cities to _____ north were brought to _____ Spanish leaders. These stories led _____ Spaniards to believe that _____ could find cities of gold. _____ listened with interest _____ these tales of fabulous riches. Finally, _____ determined to send an expedition _____ plunder these wealthy cities.

Coronado _____ selected by the governor _____ New Spain to lead _____ expedition. The governor had complete confidence _____ Coronado's ability _____ lead this army. Coronado's men, like _____ leader, belonged to some _____ the great families of Spain. _____ were proud of _____ noble birth and princely names. _____ of the men were _____ Cortez when he first came _____ the City of Mexico. _____ were merely attracted by _____ tales of the great wealth _____ fame which the followers _____ Cortez and Pizarro had won. _____ hoped that they too _____ achieve fame and fortune.

_____ Spanish Conquistadors led the expedition. _____ their fine garments, glittering armour, _____ lances and swords, they hoped _____ impress the natives along _____ way. Many were mounted _____ fine horses, and _____ even took along extra mounts.

Following _____ horsemen were groups _____ foot soldiers, both Indians _____ Spaniards. The footmen carried swords _____ shields, crossbows, and a _____ even had guns. They _____ not so gay as _____ Conquistadors who headed the expedition, _____ their hopes of finding gold _____ high. Behind the soldiers _____ herds of sheep and pigs. _____ leaders knew that the expedition _____ be away from Mexico City _____ a year or more so _____ planned to take plenty _____ food along. Coronado knew also that _____ was leading his army _____ a desert country. _____ needed plenty of supplies _____ men to carry out _____ purposes. He felt that _____ could not fail, because _____ had planned the trip so carefully.

_____ all, about three hundred Spaniards _____ eight hundred Indians started _____ this tragic adventure into _____ country north of Mexico City. _____ was one of _____ most gorgeous expeditions that _____ set forth in _____ new world. The equipment _____ finery impressed the Conquistadors _____ as well as the people _____ left behind. All of _____ people of Mexico City cheered as _____ army moved northward. Many watched _____ cavalcade move out of sight _____ longed to be going also.

No _____ suspected how few of _____ adventurers would return alive. Coronado's army left Mexico City _____ the spring of 1540 _____ did not return _____ over two years. _____ expedition explored much of _____ is now Texas and New Mexico, _____ did not find the cities _____ gold which it sought.

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